

Mechanisms of Evolution

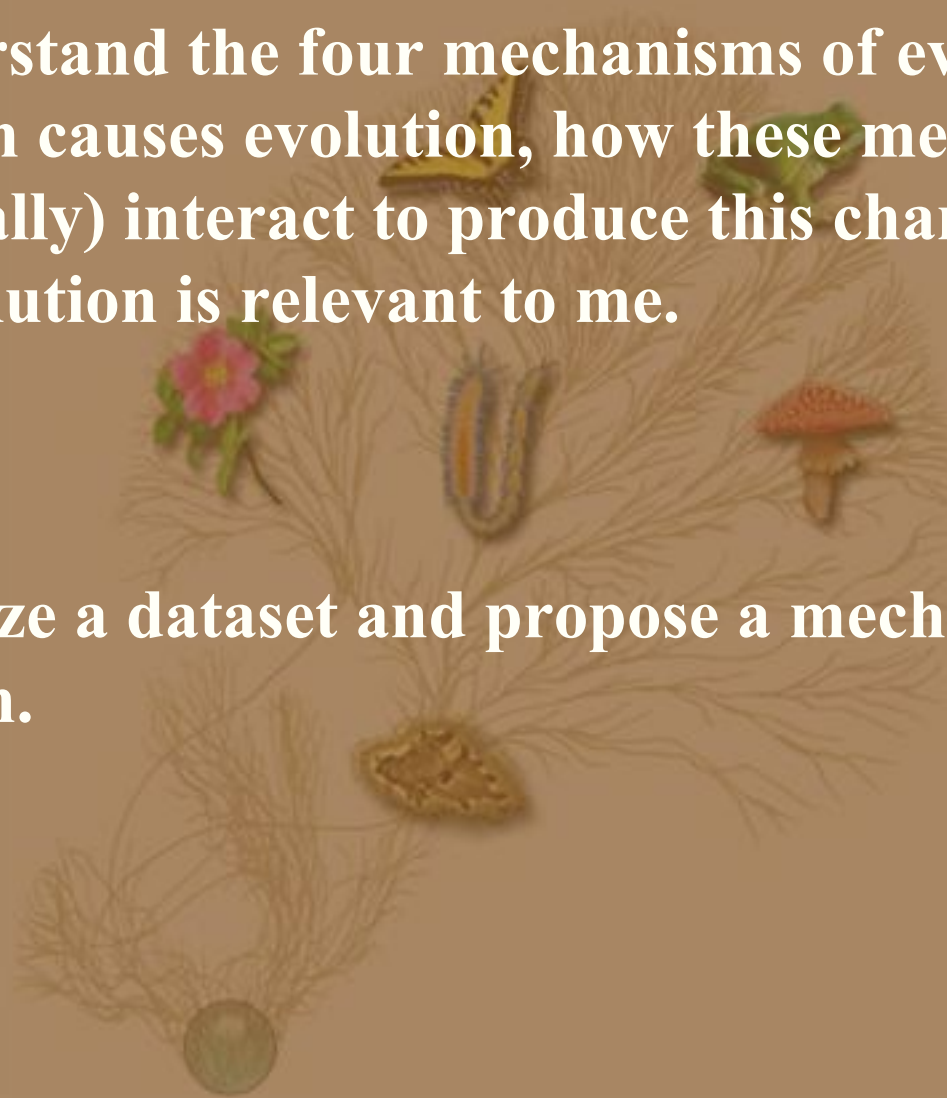


Goal(s):

1) Understand the four mechanisms of evolution, how each causes evolution, how these mechanisms (potentially) interact to produce this change, and why evolution is relevant to me.

Outcome(s):

1) Analyze a dataset and propose a mechanism for evolution.





- Peter and Rosemary Grant have been studying finches in the Galapagos Islands since 1973.

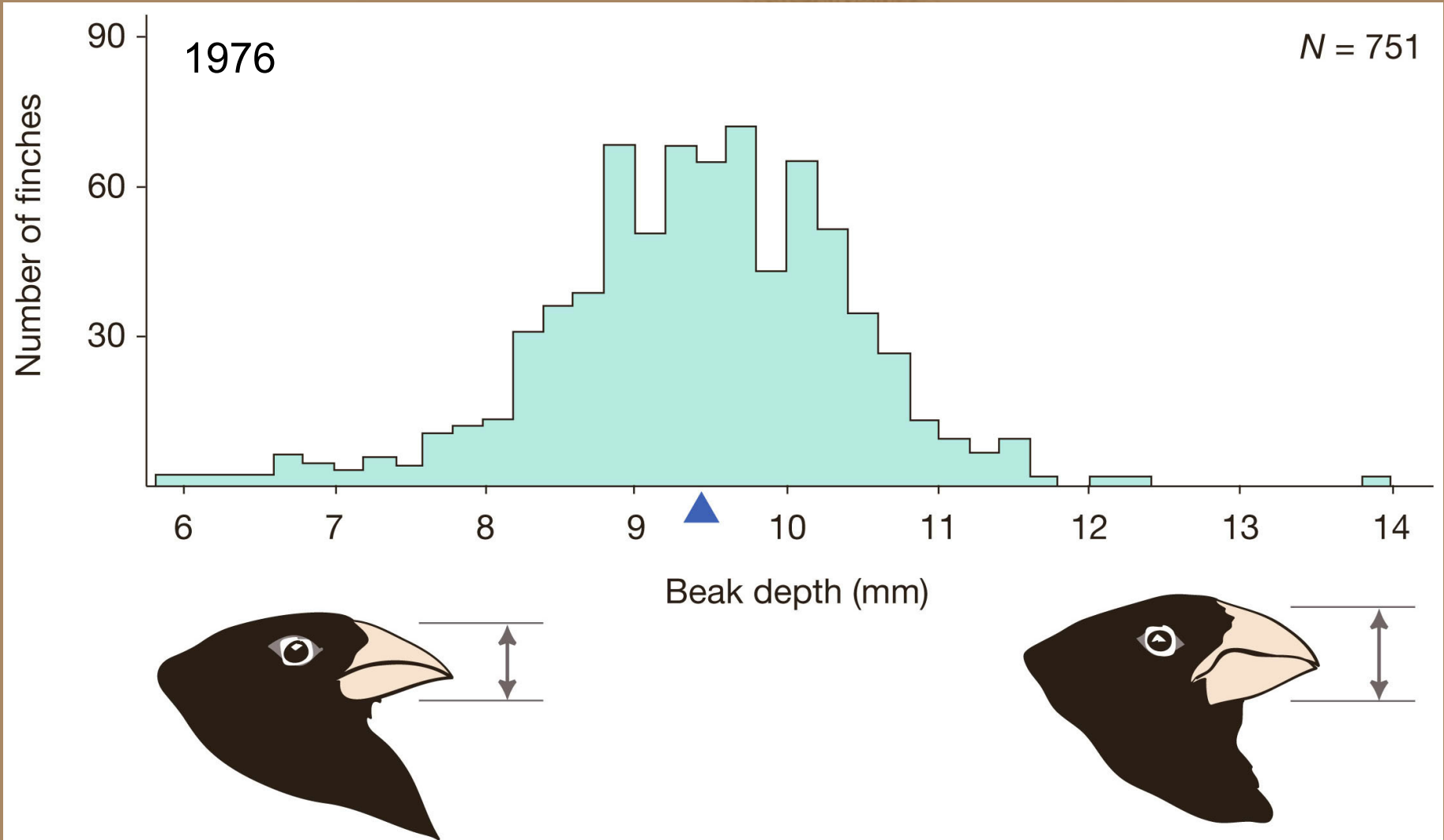


Figure 3-8a Evolutionary Analysis, 4/e
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Variation in beak depth in *Geospiza fortis*



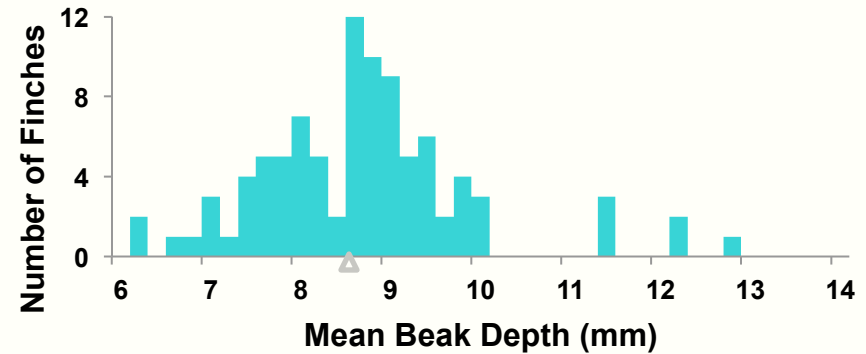
Information of Interest

1. Beak size corresponds with a preference for seed size.
i.e. large beak depth = large seeds, small beak = small seeds
2. A major drought occurred in 1977.
3. The majority of the seeds *pre-drought* = medium seeds; *post-drought* = large seeds

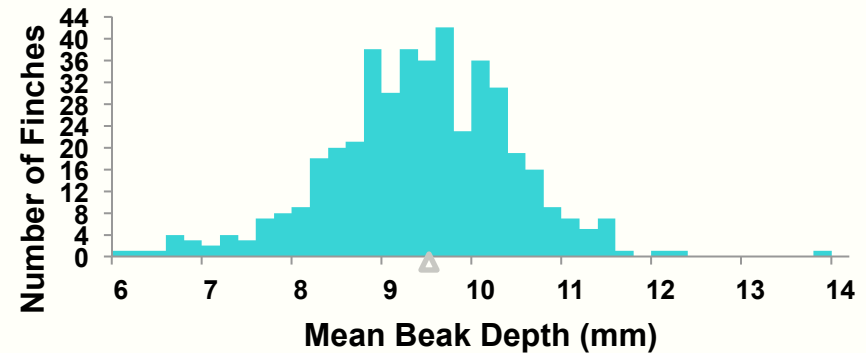
Given the information of interest and initial beak depth distribution:

Which of the following graphs best represents the beak size distribution of the population of **adults** in 1978 (after the drought)?

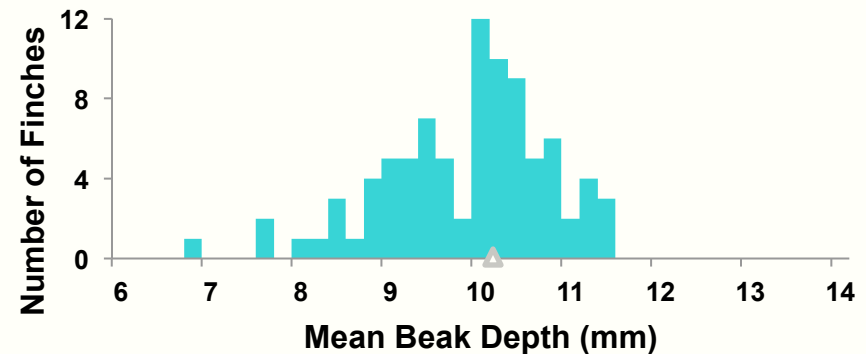
1.



2.



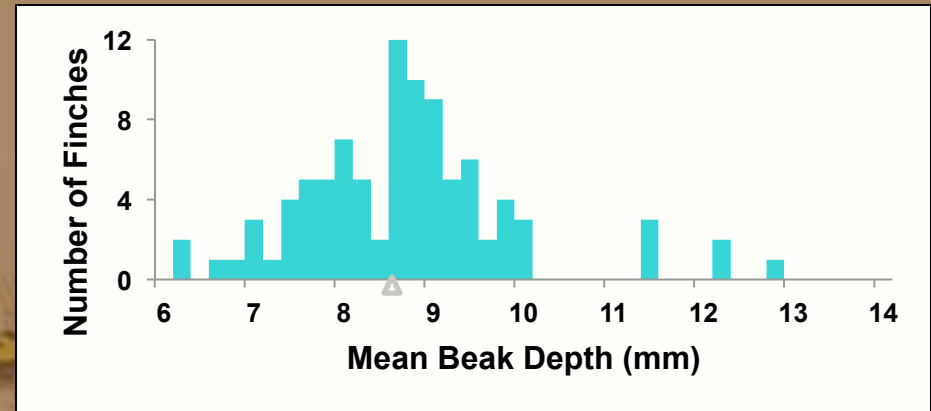
3.



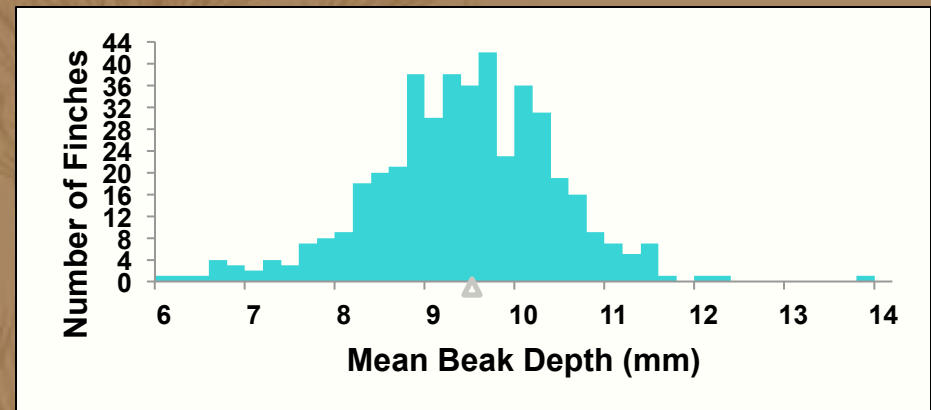
Given the information of interest and initial beak depth distribution:

Which of the following graphs best represents the beak size distribution of the population of **adults** in 1978 (after the drought)?

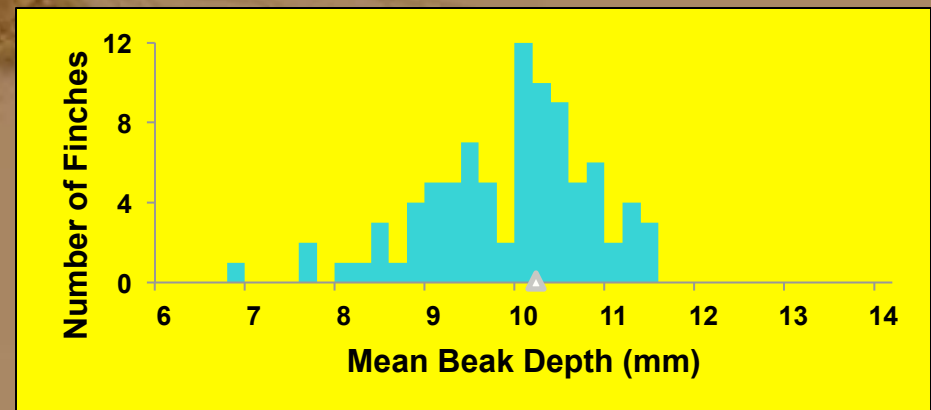
1.



2.



3.



Geospiza fortis: Offspring

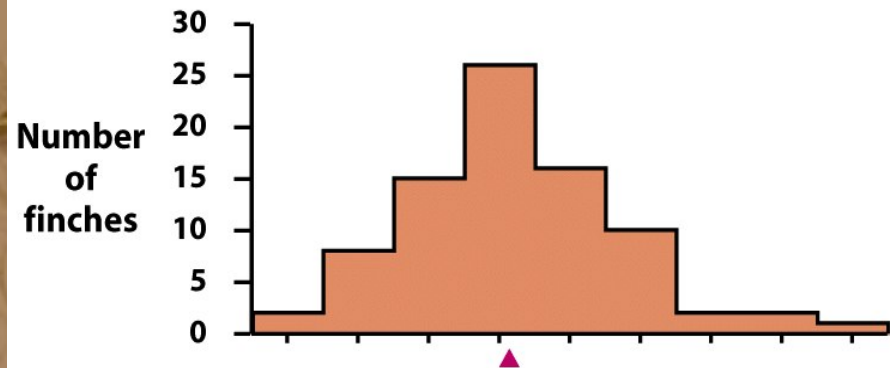
Given, genetic traits (e.g., in this case - beak depth) are *heritable*

(i.e. can be passed from generation to generation):

- (1) describe any observed difference(s) in beak size of chicks born in 1976 versus 1978, and

- (2) formulate a hypothesis to explain this difference.

Finches hatched in 1976, the year before the drought



Finches hatched in 1978, the year after the drought

